

# Self-Perceived Creativity, Family Hardiness, and Emotional Intelligence of Chinese Gifted Students in Hong Kong

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This study assessed the self-perceptions of 212 gifted students regarding their creativity, family hardiness, and emotional intelligence. There were in general no gender and age group differences on these self-perceptions, with the exception that younger students perceived their families as more hardy than did older students. The results of regression analysis indicated that family hardiness and emotional intelligence had separate and direct effects on self-perceived creativity, and their effects were additive, rather than multiplicative, as their interaction terms did not yield significant increment in variance accounted for in the criterion of prediction. Similar results were obtained when different components of emotional intelligence were considered, with some suggestive evidence that family hardiness could interact with specific components of emotional intelligence in the prediction. Implications of the findings are discussed, and caution need to be exercised in the interpretation of these results, as data were cross-sectional and collected only on student perceptions.

**F**indings in studies of parenting, education, and training have generally indicated that the family plays an important and positive role in the development of talents and potentials of gifted children (e.g., Bloom, 1985; Csikszentmihalyi, Rathunde, & Whalen, 1993; Klein & Tannenbaum, 1992; Olszewski, Kulieke, & Buescher, 1987; Piirto, 1999; Smutny, 1998). Specifically, in nurturing creativity of gifted children, the family could provide the environmental context that stimulates or sparks creativity, rewards creative ideas and behaviors, and evaluates creative products (e.g., Sternberg & Lubart, 1993). Yet, gifted children identified by conventional intellectual measures do not typically grow up to become eminent creative producers (see Olszewski-Kubilius, 2000; Subotnik & Steiner, 1994; Terman, 1925).

In this connection, Albert (1978, 1994) has provided a plausible explanation. He distinguished scholastic achiev-

ers, who typically come from cohesive and child-centered families, from creative achievers, who typically come from families with tense relationships, unconventional parenting, and parental dysfunction or loss. Accordingly, the less harmonious family conditions can motivate gifted children to obtain power, which results in creativity. Indeed, other researchers have further suggested that disharmony and a stressful home environment can be highly motivating, and despite the disturbance, it would not be devastating if there were strong supportive elements in the family (see Olszewski-Kubilius, Kulieke, & Buescher, 1987). In the same vein, Russell (1979) suggested that families that managed situational and developmental crises successfully would be higher in nurturing creativity than families that were less successful in handling crises. Csikszentmihalyi et al. (1993) also suggested that it was not stress alone, but more likely a balance of stress and support within the fam-

ily that provided the conditions conducive to high levels of talent development. More specifically, a stressful family environment could drive the gifted child to seek refuge in the safety of intellectual activities and use creative activities as emotional outlets (Ochse, 1993; Piirto, 1998) or to become psychologically mature at an early age (Albert, 1978, 1980). On the other hand, stressful childhood experiences could also prepare the gifted child to cope later in life with the intellectual tensions and marginal existence characteristic of many highly creative people (Feldman, 1994; Gardner, 1994).

Viewed in this manner, disruptive family environment and stressful childhood experiences might elicit and develop within gifted children responses and personality characteristics that are conducive to creative achievement. Such responses and characteristics could include a preference for time alone, an ability to cope with stress and tension, freedom from conventionality, and the use of intellectual or creative activities to fulfill emotional needs (Olszewski-Kubilius, 2000). Thus, it seems that family variables, including family functioning in response to stressors within and external to the family, could interact with personal variables, including coping strategies and emotional regulation, to result in creative achievement (see also Subotnik, Olszewski-Kubilius, & Arnold, 2003).

In their studies of family functioning as patterns for managing and adapting to stressors, McCubbin and McCubbin (1987, 1993) referred to the internal strength and durability of the family as "family hardiness," parallel to the notion of "individual hardiness" first developed by Kobasa (1979). Accordingly, individual hardiness encompasses both cognitive and behavioral aspects of personality that act as a buffer or mediating factor in mitigating the effects of stressors and demands. More specifically, individual hardiness consists of a sense of meaningfulness in life (commitment), a belief that change is normal in life and brings opportunities for development (challenge), and a belief that the individual can influence the events in his or her life (control). In parallel, the construct of family hardiness encompasses the notion of family members' responses to stressors in terms of family cohesion and support in the face of family tensions and disturbances.

To measure family hardiness, McCubbin, McCubbin, and Thompson (1987) developed the Family Hardiness Index (FHI), a 20-item scale that assesses four aspects of family hardiness (cooriented commitment, confidence, challenge, and control). Since the development of the FHI, it has been used in studies of family functioning to explore aspects of family resilience in the patient populations (see Sawin & Harrigan, 1995) including, for example, caregivers of patients receiving chemotherapy (Carey, Oberst,

McCubbin, & Hughes, 1991) and mothers of developmentally delayed children (Failla & Jones, 1991). It was therefore of interest to examine whether family hardiness as a set of basic attributes about the resilience of the family system could be studied in families of gifted children who might grow up to become creative producers.

Shifting the focus from family environmental variables to personal variables, one obvious consideration was an individual's ability to manage emotions in the face of stressors. More broadly conceptualized, this personal variable could encompass an individual's competencies at perceiving, understanding, and utilizing emotional information, thus exerting effective control over his or her emotional life. This personal variable is now more commonly described as an individual's "emotional intelligence" (Salovey & Mayer, 1990). However, different researchers and practitioners might view emotional intelligence somewhat differently, as a spectrum of abilities or as abilities and personality characteristics (see Ciarrochi, Chan, & Caputi, 2000; Goleman, 1995; Mayer & Salovey, 1997; Mayer, Salovey, & Caruso, 2000a, 2000b). For example, Mayer and Salovey have defined emotional intelligence by the specific competencies it encompasses, organizing skills in four branches: perceiving emotions, facilitating thought, understanding emotions, and managing emotions. Research studies have also demonstrated that successful coping depends on an integration of these emotional competencies. Indeed, emotional intelligence has been found to foster effective coping with past events and traumatic experiences (e.g., Nolen-Hoeksema, McBride, & Larson, 1997; Pennebaker, 1997), anticipation of desired goals in the future (e.g., Taylor, Pham, Rivkin, & Armor, 1998), and current events and chronic stress (e.g., Folkman & Moskowitz, 2000a, 2000b).

To assess the construct of emotional intelligence, Schutte and her colleagues (1998) constructed and developed a 33-item self-report Emotional Intelligence Scale (EIS) based on the Mayer-Salovey (1997) model of emotional intelligence. In studies related to the instrument's development, they have demonstrated its sound psychometric properties, including its reliability and validity. While their findings based on the responses to EIS suggested that the scale could be conceptualized as a unidimensional scale of global emotional intelligence, other studies have distinguished factors that were related to trait emotional intelligence and information-processing emotional intelligence (e.g., Petrides & Furnham, 2000).

In assessing the emotional intelligence of Chinese gifted students in Hong Kong, Chan (2003) used a Chinese version of the EIS and identified four dimensions of emotional intelligence: social skills, self-management

of emotions, empathy, and utilization of emotions. While these dimensions do not map nicely into the four branches delineated in the Mayer-Salovey (1997) model, they were found to predict gifted students' use of specific social coping strategies, which in turn significantly predicted specific psychological symptoms (Chan, 2004). Since gifted students might have heightened sensitivities to emotions that demanded accurate appraisal, as well as appropriate regulation (Piechowski, 1997), one could surmise that those who were more emotionally intelligent would perhaps engage in using more adaptive coping strategies, which might in turn lead to their reduced vulnerability to psychological distress (see Mayer et al., 2001). In this connection, it was of great interest to examine whether emotional intelligence would interact with family environmental variables to influence creativity in gifted students.

Despite the widespread conjecture that family environments are important in children's development, academic achievement, and talent development in Chinese societies (see Hau & Salili, 1996; Stevenson & Lee, 1996), there is relatively little research studying the influence of family environmental variables on gifted students' creativity in Hong Kong. This issue is particularly relevant because creativity has been included as one aspect of giftedness targeted for enhancement in Hong Kong students, and home environment, apart from classroom environment, has been recognized as playing a role in the nurturing of talents, including creativity, in children (see Hong Kong Education Commission, 1990; Hong Kong Education Department, 2000). Indeed, it is recognized that Chinese parents usually have high expectations of their children with respect to academic achievement, and they place a high value on hard work and effort (see Stevenson & Lee). On the other hand, Chinese parents also emphasize cultural values of respecting rules, respecting their elders, and cooperating and maintaining harmonious relationships with others (Wu, 1996). Thus, one might conjecture that Chinese parents, who value promoting family cohesion over encouraging children to achieve independence, might enhance their children's academic achievement, but impede the development of their creativity. However, contrary to expectation, in his examination of the relationship between family environmental variables and creativity among gifted students, Chan (in press) found that family cohesion, which was conceptualized as the family's encouragement of members' conformity and interdependence, rather than independence, did not impede creativity, but instead significantly predicted creativity. Admittedly, the amount of variance accounted for in the criterion variable of self-report creativity was relatively modest, suggesting that, apart from family cohe-

sion or support, other variables that might interact with family environmental variables, such as personal variables, need to be included in future investigations.

Along this line, this study aimed to explore the relationships among family environmental variables, personal variables, and the creativity of gifted Chinese students in Hong Kong. Specifically, the self-perceptions of creativity, family hardiness, and emotional intelligence were assessed, and gender and age group differences on these variables were explored. The direct effects of family hardiness and emotional intelligence and their interactive effects on self-perceived creativity were explored in a series of multiple linear regression analyses.

## Method

### Participants

A total of 212 students (127 boys and 85 girls) nominated by their schools to join the gifted programs at the Chinese University of Hong Kong participated voluntarily in this study. These students were in grades 5–13 and were between the ages of 9 and 18 ( $M = 13.08$ ,  $SD = 2.89$ ). Specifically, letters were sent to principals of schools all over Hong Kong to enlist their help in recruiting gifted students. In nominating students, principals and teachers were requested to recommend students who were judged to be either gifted intellectually (with a high IQ score) or academically (with outstanding performance in school subjects) or who had demonstrated specific talents in other nonacademic areas. Since there are no generally accepted standard measures in Hong Kong schools, and schools generally do not have access to information on specific IQ scores of students, no threshold IQ score was specified, and individual schools made their own judgment on different aspects of giftedness based on their knowledge of their students. Consequently, gifted students in this study were sampled from a broad age range and could be regarded as relatively heterogeneous with respect to their gifts and talents.

### Procedures

All 212 students who accepted school nomination participated in the study with written consent from their parents. They were invited to attend group assessment sessions to complete three instruments assembled to assess their self-perceived creativity, family hardiness, and emotional intelligence. These instruments were the Chinese Creativity Self-Rating Scale (CSRS; see McCarney & Anderson, 1998; Renzulli et al., 1976), the Chinese Family

Hardiness Scale (FHS; see McCubbin, McCubbin, & Thompson, 1987), and the Chinese Emotional Intelligence Scale (EIS; see Schutte et al., 1998). Students completed these instruments anonymously and were assured that the data they provided were confidential and would be used for research purposes only.

## Measures

*Emotional Intelligence Scale.* The Chinese EIS was translated and adapted from the English 33-item EIS originally developed by Schutte et al. (1998). The 33-item EIS aims to assess different aspects of emotional intelligence; it includes the appraisal and expression of emotions in self and others, regulation of emotions in self and others, and utilization of emotions in thinking and solving problems. The EIS has demonstrated high internal consistency (Cronbach's  $\alpha$  values ranging from .87 to .90), good 2-week test-retest reliability ( $r = .78$ ), and substantial and significant correlation with theoretically related constructs such as alexithymia, mood repair, optimism, and impulse control (Schutte et al.).

In completing the Chinese EIS, participants responded by indicating their agreement to each of the 33 statements using a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Item responses can be scored on a global emotional intelligence scale and on four 3-item subscales assessing social skills, self-management of emotions, empathy, and utilization of emotions. The four subscales were developed based on item factor analysis in the study with Chinese gifted students (Chan, 2003).

*Creativity Self-Rating Scale.* The CSRS is a 10-item self-report scale developed particularly for this study to assess students' perceptions of their own creativity. Specifically, the 10 items in Chinese were written to reflect observable creative skills and behaviors in students represented by activities that were independently conducted or self-initiated, engaged the student in developing and articulating original or unique ideas in detail, demonstrated diverse interests, or required the use of multiple perspectives. These items were written as first-person statements for self-report after consulting the item content of the teacher rating creativity scale in McCarney and Anderson's (1998) Gifted Evaluation Scale and the items for rating creativity in the Scales for Rating the Characteristics of Superior Students (Renzulli et al., 1976).

In completing the CSRS, respondents were asked to indicate whether each item was descriptive of them using a five-point scale ranging from 1 (*least descriptive*) to 5 (*most descriptive*). The CSRS can be scored on a total scale reflecting students' self-perceived creativity. In a preliminary item factor analysis based on 311 gifted students,

maximum likelihood factor analysis of the item correlation matrix yielded a one-factor solution,  $\chi^2 (35) = 77.17$ ,  $p < .001$ , corresponding to the eigenvalue-exceeding-unity criterion and accounting for 37% of the total variance. The results lent support to the unidimensionality and construct validity of this scale of self-perceived creativity.

*Family Hardiness Scale.* The FHS is a 9-item self-report scale developed particularly for this study to assess students' perceptions of their family hardiness. The nine items in Chinese were written to reflect the item content of interdependence, support, and resilience of family members after consulting the items in McCubbin, McCubbin, and Thompson's (1987) Family Hardiness Index. This rewriting and adaptation was deemed necessary because past findings on the scale composed of components of commitment, challenge and control did not yield satisfactory results as a scale, as did the use of positively and negatively keyed items, which suggested that the lack of absence of hardiness was not equivalent to the presence of hardiness (see Chan, 2000a).

In completing the FHS, respondents were asked to indicate whether the items were descriptive of their families using a five-point scale ranging from 0 (*least descriptive*) to 4 (*most descriptive*). In a preliminary item factor analysis based on 311 gifted students, maximum likelihood factor analysis of the item correlation matrix yielded a one-factor solution,  $\chi^2 (27) = 41.66$ ,  $p < .05$ , corresponding to the eigenvalue-exceeding-unity criterion, and accounting for 42% of the total variance. The results lent support to the unidimensionality and construct validity of this scale of family hardiness.

## Results

To assess the self-perceived creativity, family hardiness, and emotional intelligence of the 212 gifted students, their ratings on items of the CSRS, FHS, and EIS were tabulated and separate maximum-likelihood item factor analyses were performed on each of the item correlation matrices to check on the dimensionality of the scales. The results indicated that a one-factor solution was appropriate for the CSRS and FHS and that the 12 items loaded appropriately on their relevant factors in the four-factor solution for the EIS with the relevant items. Thus, the relevant item responses were scored to yield scores on self-perceived creativity, family hardiness, and emotional intelligence, respectively.

Self-perceived creativity correlated substantially and significantly ( $p < .001$ ) with both family hardiness ( $r = .48$ ) and emotional intelligence ( $r = .71$ ), and family hardiness and emotional intelligence also correlated substantially and

Table 1

**Means, Standard Deviations, and Internal Consistency of Measures of Self-Perceived Creativity, Family Hardiness, and Emotional Intelligence (N = 212)**

|  | Item<br><i>N</i> | Scale<br><i>M</i> | <i>SD</i> | Coefficient<br>Alpha | Significant<br>Group Difference |
|--|------------------|-------------------|-----------|----------------------|---------------------------------|
| Self-Perceived Creativity                | 10               | 40.67             | 6.01      | .85                  | —                               |
| Family Hardiness                         | 9                | 21.67             | 4.77      | .87                  | Younger > Older age group       |
| Emotional Intelligence                   | 33               | 132.15            | 15.36     | .90                  | —                               |
| <i>Emotional Intelligence Components</i> |                  |                   |           |                      |                                 |
| Social Skills                            | 3                | 12.83             | 1.78      | .68                  | —                               |
| Self-Management of Emotions              | 3                | 12.41             | 2.14      | .72                  | —                               |
| Empathy                                  | 3                | 11.25             | 2.54      | .80                  | —                               |
| Utilization of Emotions                  | 3                | 11.48             | 2.37      | .67                  | —                               |

Note. Younger age group = age 9 to 12, older age group = age 13 to 18. The significant group difference is the results from multivariate and/or univariate analyses of variance.

significantly with each other ( $r = .50, p < .001$ ). The relevant items of the EIS were also scored on the four subscales of social skills, self-management of emotions, empathy, and utilization of emotions, which correlated significantly with each other ( $r = .40-.52, p < .001$ ) and with the global emotional intelligence score ( $r = .68-.76, p < .001$ ). Table 1 shows the students' mean ratings on these scales and the internal consistency measures of these scales. The three scales of self-perceived creativity, family hardiness, and emotional intelligence had relatively high internal consistency, as reflected in the values of Cronbach's  $\alpha$  values (.85-.90), whereas the four subscales of emotional intelligence had moderate and lower values (.67-.80), as would be expected from the small number of items in each subscale.

### Gender and Age Group Differences on Creativity, Family Hardiness, and Emotional Intelligence

To explore whether there were gender or age group differences on student self-ratings on creativity, family hardiness, and emotional intelligence, students were divided into two age groups using median split (age 9-12 vs. age 13-18), and gender and age group were used as grouping variables in three separate 2-by-2 (gender by age) ANOVAs. In general, all the gender and age group main effects and the interaction effects of gender-by-age for all three dependent measures were nonsignificant ( $p > .05$ ), with only one exception. The exception was the significant age group main effect on family hardiness,  $F(1, 208) = 10.71, \eta^2 = .05, p < .001$ , suggesting that the younger age

group perceived their family members as more supportive and their families as more resilient than did the older age group. The results are also summarized in Table 1.

Since the items of the EIS could also be scored on four subscales, the above procedure in exploring gender and age group differences was also repeated using the four emotional intelligence subscores as dependent measures in a multivariate analysis of variance (MANOVA). The results indicated that the overall gender main effect, age group main effect, and their interaction effect were all nonsignificant ( $p > .05$ ).

### Predicting Self-Perceived Creativity by Family Hardiness and Emotional Intelligence

To examine more closely how self-perceived creativity was related to family hardiness and emotional intelligence, a series of multiple linear regression analyses was conducted. Specifically, self-perceived creativity was used as the criterion, and regression analyses were conducted using four ordered sets of predictors.

In Analysis 1, gender and age were used as predictors (Set 1 predictors) to examine whether demographic variables could account for a substantial amount of variance in the criterion without invoking the predictors of family hardiness and emotional intelligence. Analysis 2 used two ordered sets of predictors, with Set 1 predictors entered first, followed by the Set 2 predictor of family hardiness. The changes in  $R$  square and  $F$  were computed to evaluate whether the Set 2 predictor of family hardiness pre-



dicted self-perceived creativity over and above the Set 1 predictors of demographic variables. With similar reasoning, Analysis 3 used three ordered sets of predictors, with Set 1 and Set 2 predictors entered first, followed by the Set 3 predictor of emotional intelligence. Analysis 4 included the interaction term between family hardiness and emotional intelligence as Set 4 predictors. The changes in  $R$  square and  $F$  were also computed to evaluate whether the Set 3 predictors of emotional intelligence and the Set 4 predictors of the interaction term of family hardiness by emotional intelligence predicted self-perceived creativity over and above the Set 1 and Set 2 predictors and above the Set 1, Set 2, and Set 3 predictors, respectively. To sum up, Analysis 5 used all predictors with the stepwise procedure to retain significant predictors. In these regression analyses, scores for the predictor variables of family hardiness and emotional intelligence were “centered” by subtracting the mean score for each variable from each score for that variable in order to reduce problems such as multicollinearity (see Aiken & West, 1991). Table 2 summarizes the results of the regression analyses.

From Table 2, it can be seen that Set 1 predictors of gender and age did not significantly predict self-perceived creativity. Adding Set 2 and Set 3 predictors of family hardiness and emotional intelligence to Set 1 predictors yielded substantially better prediction than using Set 1 predictors alone, and Set 2 and Set 3 predictors accounted for a significantly greater proportion of variance in self-perceived creativity. The addition of the Set 4 predictor of interaction term of family hardiness by emotional intelligence did not improve the prediction. The stepwise regression also indicated that emotional intelligence and family hardiness were the two best significant predictors. Thus, it seemed that students’ reported family hardiness and emotional intelligence had separate and direct influence on their self-perceived creativity.

Since the EIS could also be scored on four components of emotional intelligence, the above procedure was repeated in another set of regression analyses in which global emotional intelligence was replaced by the four components of emotional intelligence. Similar results were obtained, but with some slight differences. Apart from the significant predictor of family hardiness, three components of emotional intelligence (social skills, empathy, and utilization of emotions) emerged as significant predictors. Adding interaction terms of family hardiness with each of the emotional intelligence components improved the prediction only slightly, though significantly, with two interaction terms emerging as statistically significant predictors. The stepwise regression results indicated that the best predictors were family hardiness and three emotional intelligence components (social

skills, utilization of emotions, and empathy), suggesting that the interaction terms improved the prediction only slightly. Taken together, family hardiness and emotional intelligence were the consistent significant predictors of students’ self-perceived creativity, and their effects appeared to be additive, rather than multiplicative.

## Discussion

For the Chinese, the educational ideal is to nurture children for a balanced development in ethics, intellect, physique, social skills, and esthetics (*de, zhi, ti, qun, and mei*) in order to achieve education of the whole person (see Chan, 2000c). While Chinese parents in Hong Kong have traditionally emphasized the importance of their children’s academic achievement in schools (see Hau & Salili, 1996), they often overlook the nurturing of creative talents. The more recent focus on creativity enhancement only came after the Hong Kong Education Commission (1990), in its fourth report, included creativity as an aspect of giftedness targeted for development or programming for students.

In developing programs for creativity enhancement, questions have been raised as to whether the Chinese cultural values that endorse harmonious human relationships and family cohesion in Chinese families might contribute to conformity and could therefore be inimical to the development of creativity. In testing the plausibility of the conjecture that family cohesion could go against the development of creativity, Chan (in press) found that family cohesion was positively related to self-perceived creativity, suggesting that family cohesion or support, as well as parental expectations, were highly important for creativity development. While these findings might at first sight seem to go against Albert’s (1978, 1994) suggestions of the association between creativity and family tensions or disturbances, on closer examination a more plausible explanation might be that family tensions or stressors could still be important for creativity development, but family members’ responses in terms of support and coping could be even more important. Building on these past findings, it was therefore of great interest to evaluate whether family hardiness and emotional intelligence would affect creativity separately or interactively.

In assessing creativity, family hardiness, and emotional intelligence, self-perceptions and self-reports were employed, assuming that students knew themselves and their families best. Students responded by indicating the extent to which they could be described as engaging in certain behaviors and activities that could be regarded as reflecting creativity and emotional intelligence or the

Table 2

**Multiple Regression Analyses for the Prediction  
of Self-Perceived Creativity Using Demographic Variables,  
Family Hardiness, and Emotional Intelligence (N = 212)**

| Criterion  | Analysis Set | R <sup>2</sup> | Adj. R <sup>2</sup> | R <sup>2</sup> Change | F         | F Change  | Significant Predictor                       | t        |
|--|--------------|----------------|---------------------|-----------------------|-----------|-----------|---|----------|
| <i>Using gender, age, family hardiness and emotional intelligence as predictors</i>                  |              |                |                     |                       |           |           |   |          |
| Self-Perceived Creativity  | 1            | .01            | .00                 | —                     | 1.28      | —         | —   | —        |
|  | 2            | .26            | .25                 | .24                   | 23.92***  | 68.39***  | Gender                                      | 2.18*    |
|  |              |                |                     |                       |           |           | Family hardiness                            | 8.27***  |
|  | 3            | .53            | .52                 | .27                   | 58.56***  | 121.06*** | Family hardiness                            | 2.54*    |
|  |              |                |                     |                       |           |           | Emotional intelligence                      | 11.00*** |
|  | 4            | .53            | .52                 | .00                   | 46.69***  | .15       | Family hardiness                            | 2.40*    |
|  |              |                |                     |                       |           |           | Emotional intelligence                      | 10.93*** |
|  | 5            | .52            | .52                 | —                     | 114.70*** | —         | Emotional intelligence                      | 11.40*** |
|  |              |                |                     |                       |           |           | Family hardiness                            | 2.87**   |
| <i>Using gender, age, family hardiness, and four emotional intelligence components as predictors</i> |              |                |                     |                       |           |           |   |          |
| Self-Perceived Creativity  | 1            | .01            | .00                 | —                     | 1.28      | —         | —   | —        |
|  | 2            | .26            | .25                 | .24                   | 23.92     | 68.39***  | Gender                                      | 2.18*    |
|  |              |                |                     |                       |           |           | Family hardiness                            | 8.27***  |
|  | 3            | .46            | .44                 | .45                   | 25.02***  | 19.47***  | Family hardiness                            | 3.91***  |
|  |              |                |                     |                       |           |           | Social skills                               | 3.44***  |
|  |              |                |                     |                       |           |           | Empathy                                     | 2.25*    |
|  |              |                |                     |                       |           |           | Utilization of emotions                     | 3.38***  |
|  | 4            | .49            | .46                 | .03                   | 17.44***  | 2.70*     | Family hardiness                            | 3.53***  |
|  |              |                |                     |                       |           |           | Social skills                               | 3.47***  |
|  |              |                |                     |                       |           |           | Empathy                                     | 2.16*    |
|  |              |                |                     |                       |           |           | Utilization of emotions                     | 3.73***  |
|  |              |                |                     |                       |           |           | Family hardiness by Social skills           | 2.24*    |
|  |              |                |                     |                       |           |           | Family hardiness by Utilization of emotions | -2.65**  |
|  | 5            | .45            | .44                 | —                     | 41.74***  | —         | Social skills                               | 4.35***  |
|  |              |                |                     |                       |           |           | Family hardiness                            | 3.94***  |
|  |              |                |                     |                       |           |           | Utilization of emotions                     | 3.69***  |
|  |              |                |                     |                       |           |           | Empathy                                     | 2.79**   |

*Note.* The ordered sets of predictors are Gender and Age (Set 1 predictors), Family Hardiness (Set 2 predictor), Emotional Intelligence or the 4 emotional intelligence components (Set 3 predictors), and the interaction terms of Family Hardiness by Emotional Intelligence or Family Hardiness by each of the 4 emotional intelligence components (Set 4 predictors). Analysis 1 included Set 1 predictors; Analysis 2 included Set 1 and Set 2 predictors; Analysis 3 included Set 1, Set 2, and Set 3 predictors; Analysis 4 included Set 1, Set 2, Set 3, and Set 4 predictors. Analysis 5 included all predictors and followed a stepwise procedure with criteria of .05 or less as probability of F to enter and .10 or above as probability of F to remove.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

extent to which they perceived their family members engaging in certain behaviors and activities that could be regarded as reflecting family hardiness. Arguably, method variance might elevate the associations among these variables, and it was not unlikely that different judges or observers making different ratings could yield results that

attenuated such associations.

Regarding status group differences in self-perceptions, there were no significant gender differences in students' perceptions of their creativity, emotional intelligence, and family hardiness. Similarly, younger and older students did not perceive any significant differences in their creativity

and emotional intelligence, but younger students did perceive their families as more hardy than did older students. It is plausible that older students could be more influenced by peers than were younger students, or they might have more realistic pictures of the vulnerabilities in family functioning when confronting stressors, both internal and external. These possible subtle differences on students' perceptions are topics worthy of further investigation.

This study yielded data that shed light on the relationships among family hardiness, emotional intelligence, and self-perceived creativity, and it provided opportunities to evaluate these relationships in the regression analyses. Contrary to the initial conjecture that family hardiness might interact with emotional intelligence in the prediction of self-perceived creativity, family hardiness and emotional intelligence were found to have additive, rather than multiplicative, effects on creativity, suggesting that their impacts were compensatory. However, when the four components of emotional intelligence, rather than global emotional intelligence, were considered in the prediction of self-perceived creativity, the significant and salient predictors that emerged were social skills, utilization of emotions, and empathy. Moreover, social skills and utilization of emotions did separately interact with family hardiness in the prediction of self-perceived creativity. However, the interactive effects were relatively modest compared with the predominant independent effects of family hardiness and emotional intelligence components.

Thus, students who perceived their family as more hardy and they as being more emotionally intelligent also perceived themselves as engaging more in behaviors and activities that could be regarded as creative. In other words, creative students could be more emotionally intelligent, and they were more likely to come from families that were resilient. However, caution should be exercised in the interpretation of such relationships as the prediction of creativity by family hardiness and emotional intelligence was based on cross-sectional data. The prediction of adult creative achievement would require a longitudinal design and warrants future investigations.

Despite the call for cautious interpretation, the present findings have implications for clarifying the role of family environment in children's creativity development. To nurture children's creativity, intervention efforts need to be made not only in enhancing their emotional intelligence, but also in promoting family functioning to be more hardy or supportive in the face of family stressors. Accordingly, Chinese parents who strive to maintain family harmony at all costs might be better advised that family disharmony can be constructive and that family hardiness or resilience and adaptive coping with family stressors can be more conducive to chil-

dren's creativity development. One might further speculate that Chinese teachers with similar cultural values as parents could also be informed of the possibly important role of disharmonious classrooms for student creativity. With this view, teachers who promote a learning environment with challenge and support, rather than one with order and harmony, might be promoting the enhancement of student creativity. Nonetheless, the extent to which the present findings on the family environment can be applied to the classroom environment deserves further investigation.

Apart from the limitation of cross-sectional data, this study has many other limitations, including the reliance on the use of self-report measures on assessing emotional intelligence, family hardiness, and creativity. This limitation must also be borne in mind in the interpretation of the present findings based on student perceptions, as method variance might inflate the associations among these variables and spuriously increase the predictability of self-perceived creativity from family hardiness and emotional intelligence.

Regarding the self-report instruments, the FHS as a measure constructed and developed specifically for this study has been found to have good psychometric properties, including construct validity and internal consistency. Future studies might refine and expand the measure to cover more comprehensively other crucial aspects of family functioning relevant to the development of creativity. On the other hand, the CSRS as the self-report measure on creativity, while having sound and acceptable internal consistency, is in need of external validation, as it is understood that the self-perception of creativity might not correspond well with performance and behavioral measures tapping the manifestations of creative talents.

Arguably, the use of self-report measures, at least as complementary measures, might be partly justified, considering that self-recognition of talents by the students themselves could be an initial step toward the development of creative potentials. Further, judgments or observations of the manifestations of creative potentials or creativity by different judges in the field might not be convergent (see Chan, 2000b). Nonetheless, future studies might consider other objective, performance- or product-based measures to reflect creative talents. These measures might include students' creative products or other evidence of creative productivity.

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